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CASE REPORT

Post-traumatic osteochondroma formation after femoral plate fixation: a case report

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Introduction

Osteochondroma is the most benign bone tumour. These lesions are usually solitary and have been estimated in as many as 3% of the population. They are probably developmental malformations rather than true neoplasms and are thought to originate within the periosteum as small cartilaginous nodules. The lesions are seen most often on the distal femur, the proximal tibia and the proximal humerus.[3] Rarely do they develop in a joint.[2]

Osteochondromas can be isolated or multiple; also, a hereditary form of multiple hereditary exostoses is inherited as an autosomal dominant condition with varying penetrance.[6] The lesions are of two types: those that are pedinculated and those that are broad based. They have cortical and cancellous bone components which are covered by a cartilaginous cap. Typically the thickness of the cartilaginous cap is 1—3 mm. The cap may be thin or absent in skeletally mature patients.[3]

Secondary osteochondromas have been reported following irradiation,[4,8] osteomyelitis[9] and trauma.[1,5,7] The pathomechanism of the post-traumatic osteochondromas are not well-recognised in the literature.

We report a case of osteochondroma on the lateral distal femur after plate fixation of a femoral fracture following a motor vehicle accident.

Case report

An 11-year-old boy admitted to the emergency room after being struck by a motor vehicle. The clinical and radiologic examination of the patient revealed closed femoral fracture on the left (Fig. 1A and B). The patient underwent open reduction and plate fixation without complication (Fig. 2).

Six months postoperatively, radiographs showed good bone healing and alignment with solid cortical union. A partially calcified lesion associated with the lateral aspect of the femur was noted just distal to the plate (Fig. 3). There were no symptoms and a mass lesion at that time.

At 13 months postoperatively, the patient complained of pain on the lateral aspect of his left femur after exercise. Physical examination showed prominent mass and local tenderness on the lateral aspect of his left thigh. There was no limitation of range of motion. X-rays showed an osteochondroma arising from the femur (Fig. 4). The patient under-

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Figure 1 (A and B) AP and lateral radiograph of the closed left femur fracture.

went operative extraction of the plate—screw implants and excisional biopsy of the exostosis (Fig. 5). At operation, a pedinculated osteochondroma and a well-formed cartilaginous cap was found macroscopically.

Figure 2 AP radiograph of the femur fracture after open reduction and plate fixation.

Discussion

Post-traumatic osteochondroma formation is an uncommon complication that usually follows local trauma. Bates and Osborne[1] reported a case after calcaneal fracture. Mintzer et al.[5] reported a 7-year-old child who developed an osteochondroma after a displaced Salter-Harris type II fracture of the distal fibula. Scoggin and Jacques[7] also reported a case of osteochondroma following tibial fracture. All these cases like ours, were diagnosed approximately 1-year post-injury.

Osteochondroma is defined as ''a cartilage capped bony projection on the external surface of a bone'' and accepted as a hamartoma which develops from aberrant-growth cartilage.[3] A number of theories have been advanced to explain the occurrence of solitary and multiple tumours: as a result of recent genetic studies, single osteochondroma has been described as a benign neoplasm and hereditary multiple osteochondroma as an hereditary neoplastic syndrome.[6] Virchow postulated the cartilaginous growths may result from the separation of cartilage pieces from the growth plate in a secondary location nearly one century ago. In 1913, Muller wrote that these osteochondromas may arise from the cambium layer of the periosteum.[9]

In our case, the lesion was diagnosed as an osteochondroma radiographically, because its cortex is continuous with the cortex of the femur and

Figure 3 AP radiograph of the left femur after 6 months of operation. A partially calcified periosteal lesion associated with the lateral aspect of the femur was noted just distal to the plate.

macroscopically, because it had a cartilaginous cap. We thought that the osteocartilaginous tissue formation was the result of periosteal contusion at the time of the trauma. To the best of our knowledge this is to be the first case of post-traumatic osteochondroma formation following femoral plate fixation.

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Figure 4 AP radiograph shows osteochondroma on the lateral aspect of the left femur after 13 months post-injury.

Figure 5 AP radiograph of the femur after resection of the lesion.

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